CLAIMS

1. A method of converting venous blood values to arterial blood values, said method comprising the steps of:
- a1) measuring arterial oxygenation,
- b) measuring and estimating values of venous blood acid/base status and oxygenation status of a venous blood sample,
- c) converting the venous blood values by applying a mathematical model for estimating and/or calculating blood acid/base status and oxygenation status into estimated arterial blood values.

2. A method of converting venous blood values to arterial blood values, said method comprising the steps of:
- a2) estimating arterial oxygenation,
- b) measuring and estimating values of venous blood acid/base status and oxygenation status of a venous blood sample,
- c) converting the venous blood values by applying a mathematical model for deriving blood acid/base status and oxygenation status into estimated arterial blood values.

3. A method of converting venous blood values to arterial blood values, said method comprising the steps of:
- b) measuring and estimating values of venous blood acid/base status and oxygenation status of a venous blood sample,
- a1) measuring arterial oxygenation,
- c) converting the venous blood values by applying a mathematical model for deriving blood acid/base status and oxygenation status into estimated arterial blood values.

4. A method of converting venous blood values to arterial blood values, said method comprising the steps of:
- b) measuring and estimating values of venous blood acid/base status and oxygenation status of a venous blood sample,
- a2) estimating arterial oxygenation,
- c) converting the venous blood values by applying a mathematical model for deriving blood acid/base status and oxygenation status into estimated arterial blood values.

5. A method according to any of claims 1-4, said measuring and analyzing comprising the further steps of:

- d) drawing an anaerobic venous blood sample,
- e) analysing said anaerobic venous blood sample for evaluating the acid/base status of the venous blood sample, and
- f) analysing said anaerobic venous blood sample for evaluating the oxygenation status of the venous blood sample.

6. A method according to any of claims 1-4, said measuring and analyzing comprising the further steps of:

- d) drawing an anaerobic venous blood sample,
- f) analysing said anaerobic venous blood sample for evaluating the oxygenation status of the venous blood sample, and
- e) analysing said anaerobic venous blood sample for evaluating the acid/base status of the venous blood sample.

7. A method according to any of claims 1-6, said method comprising the further step of

- g1) measuring the arterial oxygenation such as oxygen saturation, pressure or concentration by applying any suitable means for such measuring or estimation, said further step being performed at any time in relation to any of the steps of claims 1-3.

8. A method according to any of claims 1-7, said method comprising the further step of

- g2) estimating the arterial oxygenation such as oxygen saturation, pressure or concentration by applying any suitable means for such measuring or estimation, said further step being performed at any time in relation to any of the steps of claims 1-3.

9. A method according to claim 7 or claim 8, said method comprising the even further step of

- h) simulating the blood acid/base status and oxygenation status of an arterial blood sample by use of mathematical modelling.

10. A method according to claim 9, said method comprising still even further steps of

- i) mathematical modelling comprising simulated addition of oxygen, O_2, to and removal of carbon dioxide, CO_2, from the venous blood sample values in a ratio determined by the respiratory quotient,
- j) said mathematical modelling being performed until the simulated oxygen level is equal to the arterial oxygenation level measured or estimated, and
- k1) calculating the acid/base status and the oxygenation of the arterial blood by applying the result of said modelling.

11. A method according to claim 9, said method comprising still even further steps of
- i) mathematical modelling comprising simulated addition of oxygen, O_2, to and removal of carbon dioxide, CO_2, from the venous blood sample values in a ratio determined by the respiratory quotient,
- j) said mathematical modelling being performed until the simulated oxygen level is equal to the arterial oxygenation level measured or estimated, and
- k2) estimating the acid/base status and the oxygenation of the arterial blood by applying the result of said modelling.

12. A method according to any of claims 1-11, said method comprising a further step of
- l1) measuring the arterial carbon dioxide level such as carbon dioxide pressure, total concentration or bicarbonate concentration) by applying any suitable means for such measuring or estimation, said further step being performed at any time in relation to any of the steps of claims 1-6.

13. A method according to any of claims 1-11, said method comprising a further step of
- l2) estimating the arterial carbon dioxide level such as carbon dioxide pressure, total concentration or bicarbonate concentration) by applying any suitable means for such measuring or estimation, said further step being performed at any time in relation to any of the steps of claims 1-6.

14. A method according to claim 12 or claim 13, said method comprising an even further step of
- m) simulating the blood acid/base status and oxygenation status of arterial blood sample by use of modelling.

15. A method according to claim 14, said method comprising the still even further steps of
- n) mathematical modelling comprising simulated addition of O_2 to and removing CO_2 from the venous blood sample values in a ratio determined by the respiratory quotient,
- o) said modelling being performed until the simulated carbon dioxide level is equal to the arterial carbon dioxide level measured or estimated, and
- p1) calculating the acid/base status and the oxygenation of the arterial blood by applying the result of said modelling.

16. A method according to claim 14, said method comprising the still even further steps of
- n) mathematical modelling comprising simulated addition of O_2 to and removing CO_2 from the venous blood sample values in a ratio determined by the respiratory quotient,
- o) said modelling being performed until the simulated carbon dioxide level is equal to the arterial carbon dioxide level measured or estimated, and
- p2) estimating the acid/base status and the oxygenation of the arterial blood by applying the result of said modelling.

17. A method according to any of claims 5-16, where the measuring or estimating of the arterial oxygen saturation is done by pulse oximetry.

18. A system utilizing the method according to any of the preceding claims, said system comprising a blood gas analyzer, said analyzer capable of providing calculated arterial blood acid/base status and oxygenation from a venous blood sample.

19. A system utilizing the method according to any of the preceding claims, said system comprising a blood gas analyzer, said analyzer capable of providing estimated arterial blood acid/base status and oxygenation from a venous blood sample.

20. A system according to claim 18 or claim 19, said system comprising means for measuring arterial oxygenation saturation, where the means preferably is a pulse oximeter

21. A system according to any of claims 18-20, said system comprising a device for anaerobic sampling, preferably by drawing of a venous blood sample.

22. A system comprising a computer or a medical device with means for running the method according to claim 1 and any of claims 5-17, and said computer or medical device comprising one or more hardware components chosen among: blood gas analyzer and pulse oximeter.

23. A system comprising a computer or a medical device provided with means for running the method according to claim 2 and any of claims 5-17, and said computer or medical device comprising one or more hardware components chosen among: blood gas analyzer and pulse oximeter.

24. A system comprising a computer or a medical device provided with means for running the method according to claim 3 and any of claims 5-17, and said computer or medical device comprising one or more hardware components chosen among: blood gas analyzer and pulse oximeter.

25. A system comprising a computer or a medical device provided with means for running the method according to claim 4 and any of claims 5-17, and said computer or medical device comprising one or more hardware components chosen among: blood gas analyzer and pulse oximeter.

26. A device for anaerobic drawing of venous blood, said device capable of reducing any residual gases in a blood sample bottle by applying a partial vacuum within the sample bottle.

27. A device for anaerobic drawing of venous blood, said device capable of reducing any residual gases in a blood sample bottle by applying a complete vacuum within the sample bottle.

28. A device for anaerobic drawing of venous blood, said device capable of reducing the effects of any residual gases in a blood sample bottle by using gases with partial O_2 and CO_2 pressures adapted to typical venous values within the sample bottle.

29. A device for anaerobic drawing of venous blood, said device capable of reducing the effects of any residual gases in a blood sample bottle by using one or more inert gases in the sample bottle.

30. A device for anaerobic drawing of blood venous blood, said device capable of reducing any residual gases in a blood sample by dividing the sample bottle into one or more compartments with at least one compartment containing blood only.